Due: March 16, beginning of tutorial.

This assignment is worth 10% of final grade

1. This question concerns the spread of influence in a social network, namely how much friendship induces one to join a community. Consider the network/graph whose nodes are first year students at the University of Toronto who you consider to be a friend.

   (a) Define your idea of a "friend" and your idea of an "acquaintance". How many friends (strong edges) and acquaintances (weak edges) do you have?

   (b) Think about a specific course you are thinking about taking next year. (If you haven't thought about it before, think about it now.) Then ask your friends to see if they are seriously considering taking this course. (If you do not have that many friends at the University of Toronto then you may use friends or acquaintances.) (You may or may not have already asked them but lets ignore that.) How many of your friends are seriously considering taking this course? Consider the subgraph of those friends who are surely planning to take the course. Try to estimate how many edges are in this subgraph? That is, how many of your friends are friends with each other.

   (c) Write a short paragraph to indicate whether or not you feel that you are influenced by the extent (i.e. proportion) of your friends who are mutual friends. This proportion is simply the number of edges in the subgraph and divide by the total number of possible edges (i.e. if all edges were present).

2. This question concerns Milgram's small world phenomena. We would like to simulate Milgram's experiment in our internet world. Each student will be assigned two target people each with some identifying information. You are to email Mark (markml@cs.toronto.edu) to receive your two targets. You are to prepare a message (explaining the experiment and instructions for the recipient) that will be forwarded to a path of people where person A forwards to person B only if A considers B to be a "friend". (See the sketch of such a message on the following page.) Your message should be as informative and clear as possible so as to improve the chance of successfully reaching the target. You will initially forward each message (for each target person) to two different friends, using two of the following three ways to communicate: email/chat, facebook or telephone. Of course, one might be able to simply look up the target using facebook but your instructions should make it clear that the point of the exercise is only to pass messages based on the information provided about the target (as well as the path travelled thus far). Your instructions should ask each person who receives the message to email you upon receipt of the message so that you can monitor the progress of the message. If telephoning is one of the chosen options, you and all the people on the chain of messages will have to try to repeat the instructions on the phone. The experiment is to be stopped on March 9 after which you should write a report specifying:

(a) Your definition of friendship for the purposes of this question.

(b) The number of messages successfully received by the target and the type of the message (email, facebook or telephone) used and length of the path to the target.

(c) Any observations you have on the nature of the path traversed; that is, in Milgrams original experiment, paths followed a pattern that closely paralleled geographic distance.

Sketch of message to be used in question 2, the Milgram experiment

Dear ...., I am emailing you as a friend in conjunction with a University of Toronto course that the originator .... of this message is enrolled in. A course assignment is to try to simulate a famous experiment by Stanley Milgram that has become known as .... The goal of the assignment is to see how many people it will take is to reach a target person .... using email (facebook, telephoning) . (YOU MAY WANT TO ELABORATE A LITTLE ON THE EXPERIMENT TO HELP MOTIVATE THE PERSON RECEIVING THE MESSAGE.) Some information about ... is provided below. Please forward this message by email (facebook, telephone) to just one friend who might be able to better reach the target.... Please only use the information provided in this message to decide to whom to send the message.

Using the email .... of the student ....who originated this message, please send a confirmation that you have forwarded the message so that .... can keep track of its progress towards the target.

Thank you for participating.

Regards .....